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FEDERAL-STATE COOPERATIVE

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

Platte and Arkansas Drainage Basins

By

Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.

As of
MAR. 1, 1950

WATER SUPPLY OUTLOOK

PLATTE-ARKANSAS DRAINAGE BASIN

March 1, 1950

On the Platte and Arkansas drainage basins the snow accumulation to March 1 varied from 70 percent above normal on the Sweetwater River to about 20 percent below normal on the headwaters of the Arkansas. In the Northern Colorado Mountains forming the headwaters of the Platte Rivers the snow is slightly below normal for the drainage as a whole. On the Wyoming drainage of the North Platte snow cover is relatively higher. Soil moisture conditions in valley areas are dry. On the North and South Platte practically all reservoirs have more storage than for last year. On the North Platte, the major reservoirs have a record carryover from last summer's heavy flow.

CHEYENNE RIVER

Snow cover in the Black Hills of South Dakota and Wyoming has been very low during the winter. Precipitation at lower elevations has been deficient and soil moisture conditions are reported as dry. Streamflow into Belle Fourche reservoir is below normal. Storage in this reservoir is now about 70,000 acre feet as compared to 122,000 a year ago.

NORTH PLATTE RIVER

On the source of the Sweetwater river southwest of Lander, the mountain snow cover is very high. March 1 snow surveys indicated a snow water content of 70 percent above normal but less than 10 percent higher than for a year ago. A considerably different situation exists on the headwaters of the North Platte. In this area the snow cover is only slightly above normal and substantially less than for a year ago. In North Park in Colorado the valley snow cover has decreased during the last month and is less than average for this time of year. At lower elevations on the Platte watershed in Eastern Wyoming and Western Nebraska winter precipitation has been deficient and soil moisture conditions are described as dry. Irrigation water supplies below the reservoirs are assured due to the record carryover in storage from last year. Storage in the four major reservoirs on the North Platte now totals 1,650,000 acre feet as compared to 1,150,000 a year ago and a past ten-year average of about 600,000 acre feet. In the Kingsley-Sutherland reservoirs in Nebraska there is now stored 1,785,000 acre feet, slightly more than on March 1, 1950.

Miscellaneous Series Paper No. 460 - Colorado Agricultural Experiment Station

WATER SUPPLY OUTLOOK

PLATTE-ARKANSAS DRAINAGE BASIN

March 1, 1950

On the Laramie River the snow cover is similar to the North Platte. Soil moisture conditions in the Wheatland district are reported as dry. Storage in Wheatland irrigation reservoirs is now about 46,000 acre feet. Last year at this time it was 33,000 acre feet.

SOUTH PLATTE RIVER

With slightly below normal snow cover on the headwaters of the South Platte, the water supply outlook for this stream and its tributaries is much less favorable than a year ago. Because of dry soil conditions in the mountains during the fall and early winter, summer runoff may be expected to be less than current snow cover would indicate. In respect to the past average the snow cover varies from about normal on the Poudre, Thompson and Saint Vrain to as low as about 75 percent on the southern tributaries. Recent precipitation in valley areas near the mountains has been negligible and soil moisture conditions are dry. In the Fort Morgan area soil moisture is described as good with a light snow cover on the ground. Near Sterling precipitation has been sub-normal and the soil is dry. Streamflow ranges from below normal near the mountains to about normal in the lower valley. Almost without exception the carryover storage in irrigation reservoirs is well above last year, especially near Fort Morgan and Sterling. The current reservoir storage is well above the past ten-year average.

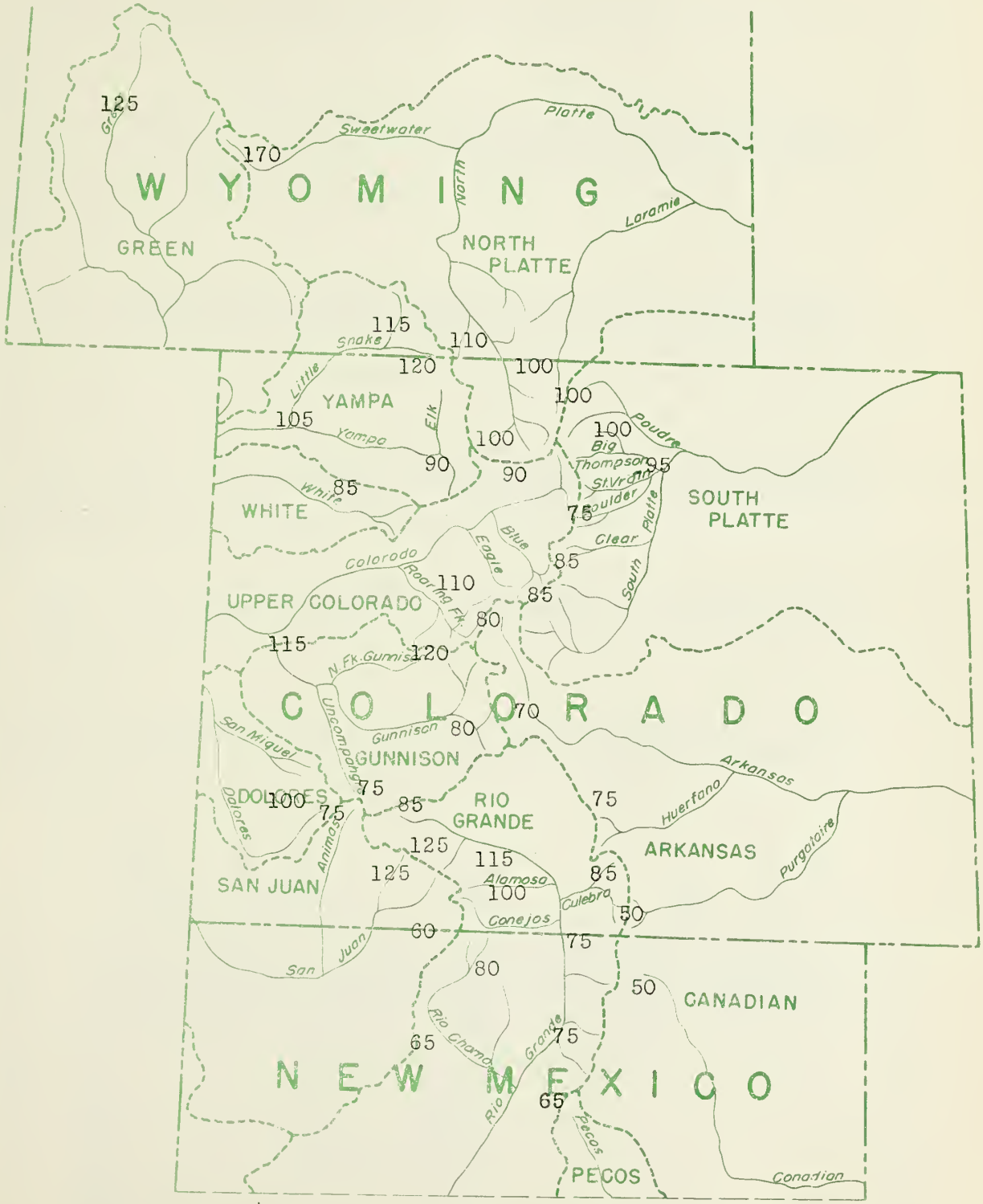
ARKANSAS RIVER

The water supply outlook for the Arkansas River and its tributaries has not improved materially since last month. There has been very little increase in snow cover. On a limited number of courses the March 1 snow water content is 82 percent of average and 74 percent of a year ago. Similar conditions exist on the Cucharas, Purgatoire and other tributaries. Precipitation has been deficient throughout the valley and soil moisture conditions are described as poor. Reservoir storage is slightly below last year except for John Martin reservoir. Streamflow is reported as fifty percent of average.

WATER CONTENT OF SNOW ON THE WATERSHEDS OF PLATTE, ARKANSAS, UPPER COLORADO AND RIO GRANDE BASINS BASED ON SNOW SURVEYS MADE APPROXIMATELY FIRST DAY OF MONTH

In Percent of Normal

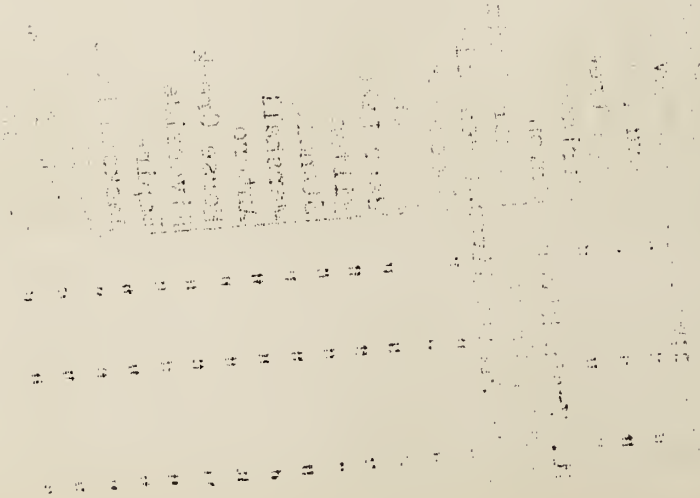
March 1, 1950



STATUS OF RESERVOIR STORAGE, PLATTE-ARKANSAS BASIN, March 1, 1950

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (Thous. A.F.)	THOUSANDS ACRE FEET IN STORAGE About March 1, 1950				
			1950	1949	1948	1947	10-year Avg.* 1939-1948
MISSOURI RIVER							
Poudre River	Windsor	18.6	11.7	3.6	12.5	9.4	10.1
" "	Cache la Poudre	9.5	7.6	2.8	9.2	5.9	6.6
" "	Fossil Creek	11.6	7.3	4.3	10.1	8.1	6.8
" "	Terry Lake	8.2	4.2	2.7	4.4	4.1½	4.4
" "	Halligan	6.4	0.0	1.3	0.0	3.6	1.6
" "	Chamber's Lake	8.8	2.0	1.3	2.7	2.6	2.7
" "	Cobb Lake	34.3	11.3	3.9	5.4	0.4	4.1
" "	Black Hollow	8.0	5.1	2.2	4.3	4.8	3.5
Big Thompson River	Lake Loveland	14.3	5.6	1.5	6.5	0.0	4.7
" " "	Boyd Lake	44.0	26.4	20.5	30.1	4.8	15.5
" " "	Lone Tree	9.2	5.4	3.3	8.0	7.5	5.3
" " "	Mariano	5.4	1.7	0.9	4.0	1.7	2.1
St. Vrain River	Union	12.7	9.0	6.1	10.6	5.5	6.9
Boulder Creek	Barker Meadow	11.7		2.7	4.6	0.0	3.4
South Platte River	Eleven Mile	81.9	81.9	81.9	81.9	81.9	78.7
" " "	Cheeseman	79.0	64.2	48.6	77.3	48.0	63.3
" " "	Marston	18.9	12.2	13.4	14.0	16.0	15.8
" " "	Barr Lake	32.2	25.2	26.2	25.9	25.4	22.1
" " "	Milton	24.4	15.7	12.2	17.1	18.8	10.6
" " "	Standley	18.5	9.2	10.4	14.6	8.8	11.2
" " "	Marshall	10.3	1.5	0.7	2.6	2.3	2.5
" " "	Antero	33.0	21.0	19.8	21.0	20.0	13.7
" " "	Horse Creek	20.6	12.0	12.4	14.7	13.5	9.0
" " "	Riverside	57.5	57.9	34.4	53.9	55.4	42.2
" " "	Empire	37.7	32.8	32.2	30.4	32.1	26.9
" " "	Jackson Lake	35.4	33.8	23.7	31.2	30.0	31.3
" " "	Prewitt	32.8	30.0	21.2	26.9	28.1	20.8
" " "	Point of Rocks	70.0	69.8	29.9	67.8	55.1	52.6
" " "	Julesburg	28.2	20.1	19.8	20.3	20.7	20.3

*Some for shorter periods



RESERVOIR STORAGE, Cont.

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (Thous. A.F.)	THOUSANDS ACRE FEET IN STORAGE ABOUT MARCH 1				
			1950	1949	1948	1947	10-year Avg.* 1939-1948
North Platte River	Kingsley-Sutherland	2180.0	1785.0	1667.7	1622.0	1208.3	702.0
" " "	Minatare	60.8	24.9	18.2	21.6	18.8	21.2
" " "	Alcova	190.0	154.9	129.5	109.6	83.7	60.4
" " "	Seminoe	1025.0	604.0	547.7	631.4	339.0	214.3*
" " "	Guernsey	46.0	47.2	19.6	44.5	44.0	36.9
" " "	Pathfinder	1045.5	846.1	459.8	578.6	415.4	278.1
Laramie River	Wheatland	70.4	45.8	32.8	69.8	22.7	31.5*
ARKANSAS RIVER							
Arkansas River	Twin Lakes	57.9	22.9	22.9	37.5	21.2	28.0
" "	Sugar Loaf	17.4	6.5	7.6	10.6	7.7	8.3
" "	Clear Creek	11.4	6.8	7.4	9.4	4.0	5.6
" "	Meredith	41.9	6.2	21.8	32.6	27.0	23.3
" "	Horse Creek	26.9	7.0	15.6	16.8	17.2	10.7
" "	Adobe Creek	61.6	29.5	30.2	55.0	31.6	32.4
" "	Cucharas	40.0	4.1	8.6	18.4	2.3	7.0
" "	Two Buttes	40.9	21.8	10.0	--	7.9	8.2*
" "	John Martin	655.0	155.3	138.0	59.6	53.8	45.5*
" "	Great Plains	150.0	72.0	100.1	111.3	71.7	53.9
Purgatoire River	Model	15.0	0.9	1.6	3.5	2.6	4.8
CHEYENNE RIVER							
Cheyenne River	Belle Fourche	198.1	69.8	122.5	149.8	149.8	101.1

*Some for shorter periods

SUMMARY OF MARCH 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

PLATTE-ARKANSAS DRAINAGE BASINS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average	Snow Density			1950 Water Content in percent of	
	Fourteen Year Avg.*	1949	1950	Fourteen Year Avg.*	1949	1950		Fourteen year Avg.*	1949	1950	Fourteen year Avg.*	1949
CHEYENNE RIVER	In.	In.	In.	In.	In.	In.		Percent	Percent	Percent		
Cheyenne River	22.4	30.5	14.6	5.4	8.4	3.0	3	24	28	21	56	36
PLATTE RIVER												
Sweetwater	38.7	58.6	53.3	10.2	16.3	17.4	2	26	28	33	170	107
North Platte River	50.4	51.5	50.2	14.6	20.7	15.4	10	29	36	31	106	74
Laramie River	35.2	42.1	32.5	9.5	13.4	9.6	8	27	32	30	101	72
South Platte River**	22.8	27.5	23.4	4.9	6.2	4.1	3	22	23	18	84	67
Crow Creek	17.8	25.6	10.4	4.2	8.0	2.3	1	24	30	22	55	29
Poudre River	34.5	39.2	33.2	9.5	14.0	9.4	6	28	36	28	99	62
Big Thompson River	47.5	55.0	46.1	12.6	19.3	12.8	2	27	35	28	101	61
St. Vrain River	37.8	45.5	39.0	9.6	15.5	11.0	1	27	34	28	115	71
Boulder Creek	31.2	33.3	28.8	9.5	11.2	6.9	2	30	34	24	73	62
Clear Creek	43.3	45.8	41.4	11.6	13.1	10.2	2	27	29	25	88	78
ARKANSAS RIVER	33.6	34.6	27.6	8.1	8.9	6.6	7	24	26	24	82	74

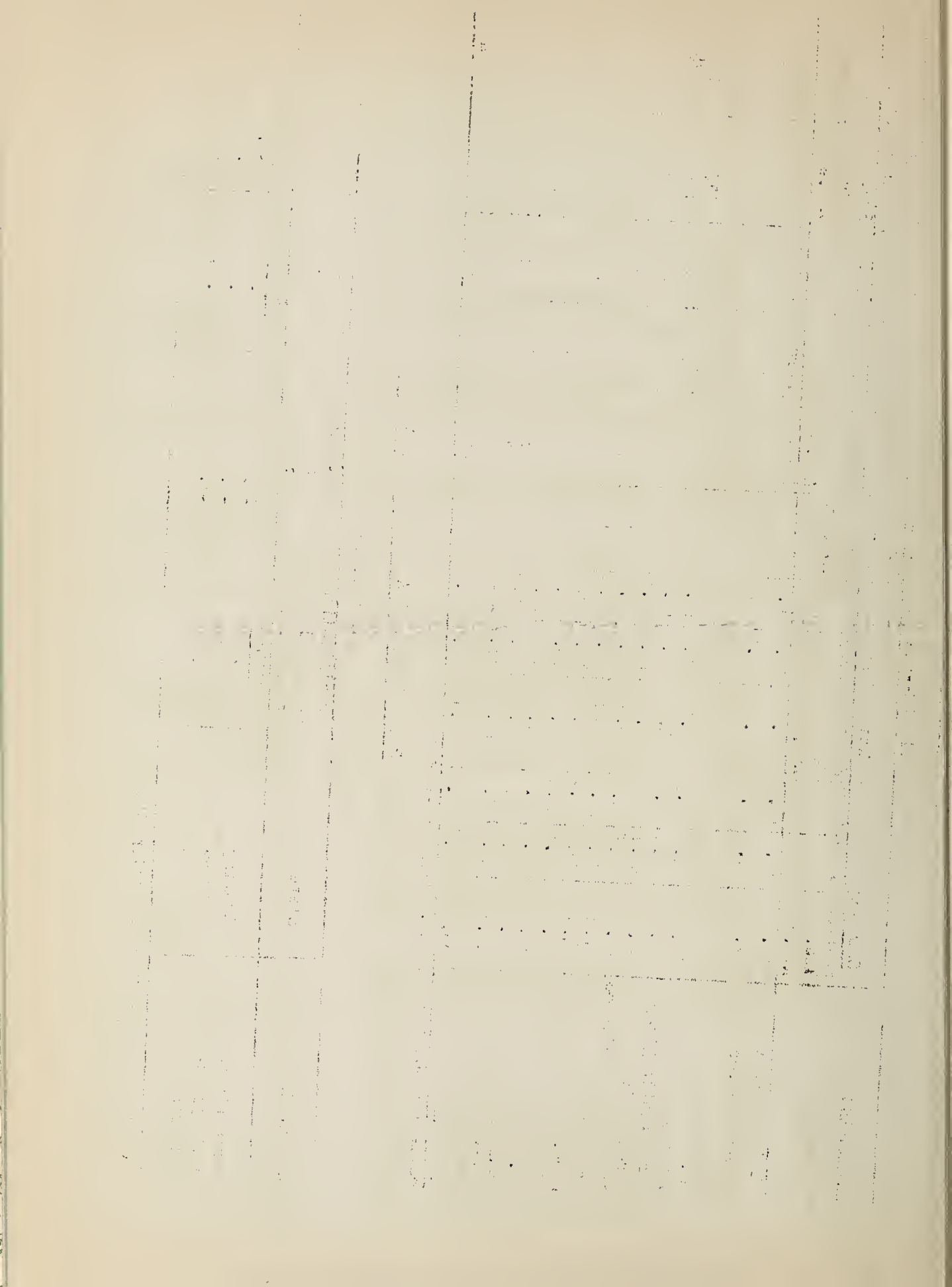
*Same for shorter periods. **Above Denver

PRECIPITATION DATA*

March 1, 1950

WATERSHED	State	Precipitation October 1 to February 28	Departure from Normal	Precipitation February	Departure from Normal
		Inches	Inches	Inches	Inches
North Platte	Wyoming	4.58	+ .09	0.45	-0.52
South Platte	Colorado	3.56	-0.60	0.88	+0.26
Arkansas	Colorado	3.53	-1.82	0.75	-0.36

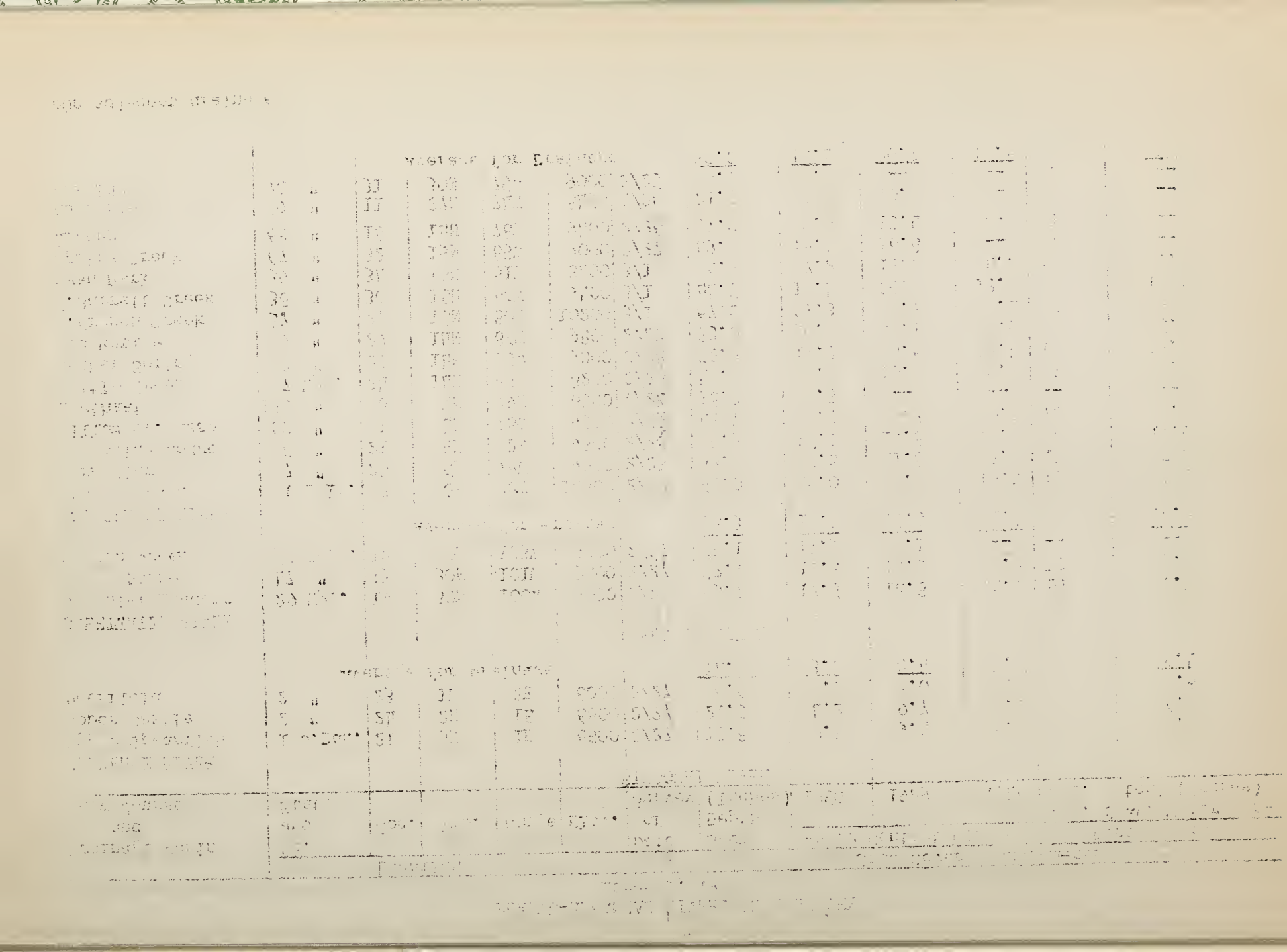
*Average Selected High Elevation Stations



PLATTE-ARKANSAS RIVERS SNOW SURVEYS
March 1, 1950

Drainage Basin and Snow Course	Location: No. and State	Sec.	Twp.	Range	Elev.	Snow Cover Measurements: Date of Survey	Snow Depth (Inches)	Water Content (Inches): 1950	1949	1948	Past Record: Yrs. of Rec.	Av. Water Content (Inches)
MISSOURI RIVER												
CHEYENNE RIVER												
Upper Spearfish	1 S.Dak.	21	3N	1E	6500	2/27	15.8	2.8	9.4	6.0	6	6.0
Upper Castle	2 "	24	2N	1E	6800	2/27	21.5	4.2	9.7	5.6	6	6.6
Deerfield	2 "	23	1N	2E	6000	2/27	6.6	2.0	6.0	3.5	6	3.6
	Average for Drainage						14.6	3.0	8.4	5.0		5.4
PLATTE RIVER												
SWEETWATER RIVER												
Grannier Meadows	29 Wyo.	19	30N	100W	9000	2/27	53.7	17.5	16.8	14.1	13	10.5
South Pass*	47 "	13	30N	101W	9000	2/27	52.9	17.3	15.8	9.2	10	9.9
Larsen Creek	57 Colo.	12	30N	103W	9000	2/27	55.1	17.3	13.1	--	--	--
	Average for Drainage						53.3	17.4	16.3	11.6		10.2
NO. PLATTE RIVER												
Cameron Pass	1 Colo.	2	6N	76W	10300	2/24	51.0	15.0	19.6	15.4	13	16.0
Park View	7 "	24	5N	78W	9200	2/23	33.5	7.8	11.8	7.1	14	7.6
Columbine Lodge	8 "	21	5N	82W	9300	2/28	55.9	15.1	19.8	18.0	14	17.9
Willow Cr.Pass*	62 "	1	4N	78W	9500	2/23	43.7	12.3	15.7	10.0	12	9.8
Northgate	136 "	8	1N	79W	8500	2/24	18.9	5.3	--	--	--	--
Bottle Creek	7 Wyo.	24	14N	85W	8200	2/28	44.3	14.9	18.4	9.1	12	10.6
Webber Spring	8 "	27	14N	85W	9000	2/28	52.2	17.3	23.6	13.4	12	13.8
Old Battle	9 "	29	14N	85W	9800	2/28	83.0	30.5	36.1	22.9	13	25.0
N.French Creek	37 "	27	16N	80W	10200	3/1	67.0	21.3	28.7	20.4	12	22.9
N.Barrett Creek	38 "	30	16N	80W	9400	3/1	44.5	12.4	20.1	13.0	13	14.1
Ryan Park	39 "	34	16N	81W	8400	3/1	26.5	7.2	13.6	8.2	13	8.6
Spring Creek	67 "	32	15N	85W	9000	2/27	49.5	18.1	18.8	--	1	--
Albany	68 "	18	14N	78W	9400	2/26	37.0	9.9	15.4	--	1	--
La Bonte	69 "	11	27N	74W	8450	2/26	21.0	5.1	10.0	--	1	--
Boxelder	70 "	31	30N	75W	9000	2/25	15.8	2.7	--	--	0	--
	Average for Drainage						50.2	15.4	20.7	13.8		14.6

*On adjacent drainage



PLATTE-ARKANSAS RIVERS SNOW SURVEYS
March 1, 1950

Drainage Basin and Snow Course	Location: No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Snow Cover Measurement: Water Content (Inches) 1950	1949	1948	Past Record: Yrs. of Rec.	Av. Water Content (Inches)
					PLATTE RIVER							
LARAMIE RIVER												
W.Port.G-P.Tun.	4 Colo.	7	8N	75W	8600	3/5	23.3	6.4	10.5	8.4	13	7.0
Deadman Hill*	50 "	26	10N	75W	10200	2/23	38.7	11.7	16.7	10.6	13	10.6
Roach	88 "	5	10N	77W	9800	2/25	49.0	13.5	19.4	16.4	10	14.4
McIntyre	111 "	35	10N	76W	9100	2/27	28.6	7.9	12.4	--	1	--
Brooklyn Lake	3 Wyo.	11	16N	79W	10200	3/1	58.4	19.7	19.8	12.8	13	18.5
Fox Park	11 "	21	13N	78W	9200	3/1	13.3	3.1	7.1	8.1	13	5.9
Pole Mtn. #2*	34 "	35	15N	72W	8700	2/27	10.4	2.3	8.0	6.7	13	4.2
Libby Lodge	35 "	29	16N	78W	8700	3/1	31.7	9.6	12.3	9.1	12	7.3
Hairpin Turn	36 "	24	16N	79W	9500	3/1	34.8	10.7	13.1	9.4	12	8.2
Albany	68 "	18	14N	78W	9400	2/26	37.0	9.9	15.4	--	1	--
			Average for drainage				32.5	9.6	13.4	10.2		9.5
CROW CREEK												
Pole Mtn. #2*	34 "	35	15N	72W	8700	2/27	10.4	2.3	8.0	6.7	13	4.2
POUDRE RIVER												
Cameron Pass	1 Colo.	2	6N	76W	10300	2/24	51.0	15.0	19.6	15.4	13	16.0
Chambers Lake	2 "	6	7N	75W	9000	2/26	19.6	5.4	9.2	8.0	13	5.9
Big South	3 "	33	8N	75W	8600	2/26	8.7	2.0	2.9	3.3	12	2.1
Deadman Hill	50 "	26	10N	75W	10200	2/23	38.7	11.7	16.7	10.6	13	10.6
Lake Irene*	65 "	8	5N	75W	10600	2/25	54.8	17.0	26.1	19.5	12	16.6
Hour Glass Lake	68 "	18	7N	73W	9500	2/26	26.5	5.3	9.2	6.6	10	5.5
Red Feather	128 "	26	10N	74W	9000	2/27	20.7	6.2	10.9	--	1	--
			Average for drainage				33.2	9.4	14.0	10.6		9.5
BIG THOMPSON RIVER												
Lake Irene*	65 "	8	5N	75W	10600	2/25	54.8	17.0	26.1	19.5	12	16.6
Hidden Valley	95 "	23	5N	75W	9550	2/28	37.4	8.6	12.5	10.3	9	8.7
Deer Ridge	115 "	19	5N	73W	9050	2/28	18.0	4.0	8.0	--	1	--
			Average for drainage				46.1	12.8	19.3	14.9		12.6
ST. VRAIN RIVER												
Wild Basin	41 Colo.	24	3N	74W	10000	3/1	39.0	11.0	15.5	11.1	13	9.6
Copeland Lake	116 "	21	3N	73W	8600	2/28	15.1	3.6	5.8	--	1	--
Ward	134 "	1	1N	73W	9500	3/1	14.0	3.1	--	--	0	--
			Average for drainage				39.0	11.0	15.5	11.1		9.6

*On adjacent drainage

PLATTE-ARKANSAS RIVERS SNOW SURVEYS
March 1, 1950

Drainage Basin and Snow Course	Location: No. and State	Sec.	Twp.	Range	Elev.	Snow Cover Measurements: Date of Survey	Snow Depth (Inches)	Water Content (Inches) 1950	1949	1948	Past Record: Years of Record	Av. Water Content (Inches)
						PLATTE RIVER						
BOULDER CREEK												
E. Port. Moffat T.	5 Colo	2	2S	74W	9400	3/2	20.1	5.3	2.3	5.1	13	3.1
University Camp	60 "	28	1N	73W	10300	2/27	37.4	8.6	20.2	15.5	12	15.9
Moffat	133 "	2	2S	74W	9400	3/2	25.0	6.1	--	--	0	--
	Average for drainage						28.8	6.9	11.2	10.3		9.5
CLEAR CREEK												
Loveland Pass	61 "	27	4S	76W	10600	3/1	39.8	7.9	11.6	9.9	13	10.0
Grizzly Peak*	97 "	2	5S	76W	11250	2/26	42.9	12.5	14.6	12.5	8	13.3
Empire	117 "	21	3S	75W	9650	3/2	21.5	4.6	3.4	--	1	--
	Average for drainage						41.4	10.2	13.1	11.2		11.6
SOUTH PLATTE RIVER												
Hoosier Pass	14 Colo.	13	8S	78W	11400	3/28	37.9	7.1	9.3	9.2	13	8.3
Fairplay	15 "	33	9S	77W	10000	3/1	6.7	1.0	2.2	3.0	12	0.8
Jefferson Cr.	83 "	14	7S	76W	10100	2/28	25.6	4.3	7.1	7.2	11	5.6
Geneva Park	118 "	18	6S	74W	9750	2/28	12.5	3.7	4.5	--	1	--
Antero	120 "	1	13S	77W	9200	2/27	6.5	1.6	4.7	--	1	--
Deer Creek	130 "	28	6S	78W	8950	3/1	1.4	0.3	1.6	--	1	--
	Average for drainage						23.4	4.1	6.2	6.5	0	4.9
ARKANSAS RIVER												
Tennessee Pass	19 Colo.	21	8S	80W	10200	3/1	33.2	5.8	6.2	7.7	14	7.2
Twin Lakes T.	21 "	22	11S	82W	10500	3/2	26.7	8.0	9.2	10.2	12	8.3
Marshall Creek*	42 "	24	48N	6E	10800				13.5	9.6	14	9.9
Poncha Creek	43 "	19	48N	7E	10500				10.8	9.2	14	8.2
Whiskey Creek	72 "		37.2N	105.2W	10300	3/2	10.0	2.6	6.3	--	12	5.7
La Veta Pass*	74 "	22	28S	70W	9300	2/28	18.5	4.9	8.6	10.8	12	7.4
4-Mile Park	78 "	23	11S	81W	9700	2/28	14.7	2.4	2.4	3.7	11	2.9
Fremont Pass	79 "	2	8S	79W	11400	2/27	48.0	11.6	12.8	13.6	14	12.1
Monarch Pass	92 "	16	49N	6E	10500	2/27	41.9	11.1	15.9	14.8	8	13.4
St. Elmo	119 "	31	15S	80W	10600	2/28	41.7	10.2	10.9	--	2	--
Timberline	121 "	8	9S	81W	11100	2/27	51.9	13.4	--	--	1	--
Woods Lake	131 "	2	8S	83W	11000	2/26	47.4	18.5	--	--		--
	Average for drainage						27.6	6.6	8.7	10.1		8.1

*On adjacent drainage

Federal - State - Private

COOPERATIVE SNOW SURVEYS

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Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"